Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of

Preparation for International Telecommunication Union World Radiocommunication Conferences	)))	IC Docket No. 94-31

COMMENTS OF LORAL/QUALCOMM PARTNERSHIP, L.P.

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Loral/QUALCOMM Partnership, L.P., (LQP) hereby submits its comments in response to the Commission's Notice of Inquiry, ("Notice"), in preparation for the 1995 World Radiocommunication Conference ("WRC-95").[1] As the Commission is aware, LQP is an applicant to construct GLOBALSTAR, a low-Earth orbit satellite telecommunications system (File Nos. 19-DSS-P-91(48) and CSS-91-014) to operate in the MSS/RDSS bands.

Summary and Introduction

In the Notice, the Commission established a goal for WRC-95 of developing and maintaining current and future access to spectrum for the Mobile-Satellite Service. According to the Commission, "facilitating introduction of new services such as worldwide mobile-satellite services will foster universal access to telecommunication services and could be a key component of a seamless, global communications network." See Notice, para. 1. LQP strongly supports the Commission's goal of facilitating MSS, and in these comments, sets forth proposals in four areas to accomplish this goal. First, as the Commission recognizes in the Notice, additional feeder link spectrum is essential to facilitate global MSS. Notice, paras. 22-25. LQP has spent substantial time and effort in analyzing potential MSS feeder link bands below 15 GHz, and has developed a number of new feeder link proposals which are outlined below. Adoption of international allocations for MSS feeder links is

[1] In the Matter of Preparation for International Telecommunication Union World Radiocommunication Conferences, IC Docket No. 94-31, FCC 94-96, released May 5, 1994.

necessary to complete the process initiated at WARC-92 of facilitating global MSS, and should be pursued vigorously by the United States at WRC-95.

Second, as the Commission also recognizes, unnecessary constraints imposed on MSS user links must be removed to facilitate introduction of service. Notice, para. 20. Since WARC-92, LQP has studied the constraints placed on the 1610-1626.5 MHz uplink band and the 2483.5-2500 MHz downlink band and has determined that these limits are more stringent than necessary. Accordingly, LQP proposes modifications to the international footnotes governing e.i.r.p. levels in the L-band and PFD levels in the S-band.

Third, as the Commission recognizes, the perceived need for MSS must be met by ensuring the availability of second generation spectrum. Notice, paras. 21, 26-27. Recent comments on the Commission's Notice of Proposed Rule Making point toward the substantial benefits to be provided by MSS, particularly through non-geostationary systems.[2] LQP outlines below proposals which would make additional spectrum available for MSS, thereby implementing the Commission's goals for WRC-95 and the United States' policy for the global information infrastructure.

Fourth, in response to the Commission's request for views on review of the Final Report of the Voluntary Group of Experts, Notice, paras. 5-18, LQP believes that attempted review of the Final Report at WRC-95 would obscure the mission and the goals of the United States to facilitate introduction of MSS. Accordingly, LQP recommends a procedure for orderly review of the Final Report at WRC-97.

I. LQP RECOMMENDATIONS FOR UNITED STATES PROPOSALS TO WRC-95

To facilitate the introduction of MSS systems over the next few years, several key actions should be taken at WRC-95. These actions should be included in the U.S.

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[2] See Notice of Proposed Rulemaking, 9 FCC Rcd 1094 (MSS NRPM), LQP Comments, at 13; Motorola Comments, at 5; Honeywell Comments; Red Cross Comments; and Peace Corps Comments.

proposals to the Conference, and the United States should work with other administrations in advance of the Conference to gain support for these proposals.

LQP recommends that the United States, to facilitate introduction of MSS, make the following proposals to WRC-95:

(1) allocate a number of frequencies, in the C, Ku, and Ka-band for use by non-geostationary MSS feeder links, with use on a reverse band basis permitted in the C and Ku-bands allocated to the fixed-satellite service (FSS);

(2) revise footnote 797A to make available the 5000-5250 MHz band for MSS feeder links in the Earth-to-space direction;

(3) revise the power-flux density limit for the 2483.5-2500 MHz band to provide for an appropriate PFD limit which will enable achievement of needed capacity in MSS systems and minimize coordination;

(4) revise footnote 731E to eliminate ambiguity concerning the degree of protection to be afforded the GLONASS system;

(5) revise satellite coordination procedures, such as the interim procedures in Resolution 46, to streamline the coordination process for MSS service and feeder links; and

(6) propose the allocation, on a worldwide basis, of the 2300-2310 MHz band, in the space-to-Earth direction, and 2390-2400 MHz band, in the Earth-to-space direction, for MSS, to provide additional spectrum for MSS systems.

LQP also urges that the United States propose deferral of consideration of the Report of the Voluntary Group of Experts until WRC-97, to enable all administrations to have sufficient time to evaluate the proposed revisions to the Radio Regulations and to permit focus on MSS at WRC-95.

II. THE UNITED STATES SHOULD PROPOSE ALLOCATIONS FOR MSS FEEDER LINKS IN A VARIETY OF FREQUENCY BANDS

To enable non-geostationary MSS system applicants to construct and deploy

within the shortest possible timeframe, to the benefit of U.S. industry and users throughout the world, feeder links must be available in the frequency bands required by a variety of system designs, including that of Globalstar.[3] In particular, feeder links in bands below 15 GHz are needed to ensure that LQP and other MSS system applicants are able to implement their systems as designed, in order to provide low-cost, ubiquitous telecommunications services which will interface seamlessly with existing telecommunications networks.

A. The U.S. Proposals Should Include Feeder Link Allocations in a Range of Frequency Bands.

LQP urges the Commission to proceed, within the United States process, to make available feeder links needed for the Globalstar system, as well as for other LEO MSS systems,[4] and to take the significant actions required within the WRC-95 process.

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[3] See Comments of Loral/QUALCOMM Partnership, L.P., on the Commission's proposed licensing and service rules for MSS systems using the 1610-1626.5 MHz and 2483.5-2500 MHz bands, CC Docket No. 92-166, FCC 94-11 (released Feb. 18, 1994) (NPRM).

[4] In LQP's Comments on the NPRM, LQP urged the Commission to take the following actions, within the United States process: (1) make available and authorize feeder links for LEO MSS systems in the C, Ku, and Ka-bands for both uplinks and downlinks; (2) authorize the use of reverse band working (RBW) for FSS allocations below 15 GHz for MSS feeder links; (3) allocate 200 MHz within the bands 6425 to 7075 MHz for LQP feeder downlinks, preferably in the 6875-7075 MHz range; and (4) allocate 200 MHz within the band 5000 to 5250 MHz for LQP feeder uplinks (and work with the Executive Branch to gain agreement to this use).

These actions should include proposal of co-primary allocations for MSS feeder links, on a reverse-band basis, at WRC-95, in the following frequency bands:

Frequency band	Bandwidth	FSS Direction	Proposed MSS Feederlink Direction
4500-4800 MHz	300 MHz	space-to-Earth	Earth-to-space
5000-5250 MHz*	250 MHz	space-to-Earth*	Earth-to-space
6425-6725 MHz	300 MHz	Earth-to-space	space-to-Earth
6725-7075 MHz	300 MHz	Earth-to-space	space-to-Earth
10.70-10.95 GHz	250 MHz	space-to-Earth	Earth-to-space
10.95-11.2 GHz	500 MHz	space-to-Earth	Earth-to-space
11.2-11.45 GHz	250 MHz	space-to-Earth	Earth-to-space
11.45-11.7 GHz	250 MHz	space-to-Earth	Earth-to-space
11.7-12.2 GHz	500 MHz	space-to-Earth	Earth-to-space
12.75-13.25 GHz	500 MHz	Earth-to-space	space-to-Earth
13.75-14.0 GHz	250 MHz	Earth-to-space	space-to-Earth
14.0-14.50 GHz	500 MHz	Earth-to-space	space-to-Earth

* Feeder link use for RDSS is permitted in the 5150-5216 MHz portion of this band pursuant to RR 797A. Feeder link should be expanded to the entire 5000-5250 MHz band, for MSS, as well as RDSS, as discussed below.

The U.S. proposals should also include co-primary allocations, for MSS feeder links, on a co-directional basis with FSS, in the following frequency bands:

Frequency Band	Bandwidth	Direction	Comments
15.4-15.7 GHz	300 MHz	Earth-to-space	aeronautical radionavigation
17.3-17.7 GHz	400 MHz	Earth-to-space	BSS feederlinks HDTV BSS (Region2)
17.7-17.8 GHz	100 MHz	space-to-Earth	HDTV BSS (Region2)
17.7-18.4 GHz	700 MHz	space-to-Earth Earth-to-space	BSS feederlinks
18.7-20.2 GHz	1500 MHz	space-to-Earth	FSS
27.5-29.5 GHz	2000 MHz	Earth-to-space	FSS, LMDS

To accomodate multiple U.S. and foreign proposals, the United States should propose, at WRC-95, that numerous frequency bands, including those below 15 GHz, be made available for MSS feeder links on a co-primary basis. As LQP stated in its Comments on the MSS NPRM, feeder links for non-GSO MSS systems should be available in a variety of frequency bands rather than placing all such feeder links in the 20/30 GHz band. The Commission, in the NPRM, recognizes that "feeder links below 15 GHz, and particularly at 5 GHz, are an integral part of several applicants' system proposals and, if not available, would require significant design changes to these systems."[5] Beyond requiring extensive and costly design changes, forcing all non-GSO MSS systems to utilize the 20/30 GHz band for feeder links would have serious and detrimental repercussions for the handheld MSS service which can be introduced with the non-geostationary systems. The public interest lies with accommodating a variety of LEO MSS system designs through availability of feeder links in requested bands, enabling implementation of multiple LEO MSS systems

[5] NPRM, at para. 77.

with differing characteristics and rates, thereby increasing consumer choices of telecommunications services.

B. The Feasibility of Reverse-band Working Has Been Demonstrated.

LQP, along with others in the MSS community, has performed and continues to perform extensive analyses of the feasibility of utilizing FSS allocations in the reverse direction for MSS feeder links (RBW). These analyses are discussed in Part 3 of the Technical Appendix to LQP's comments in the MSS NPRM. The analyses demonstrate and confirm that RBW will enable non-GSO MSS feeder links to be operated in FSS allocations without causing harmful interference to FSS operations. RBW is a frequency reuse technique which enhances the overall efficiency of spectrum utilization and thereby benefits all users of the spectrum. Accordingly, LQP believes that the Commission can and should move forward to make FSS frequencies available for feeder links on this basis and that it should recommend U.S. proposals to WRC-95 for allocations which enable reverse-band working.[6]

Within the ITU-R the feasibility of using FSS allocations in reverse-band operation for non-GSO MSS feeder links also is being demonstrated. The recent international ITU-R TG 4/5 meeting determined that, with regard to the Allotment Plan Bands (4.5-4.8 GHz, 10.7-10.95 GHz, 11.2-11.45 GHz and 12.75-13.25 GHz), sharing is "technically feasible, under the assumed value of EIRP density of non-GSO MSS feeder links so long as the required earth station separations could be maintained."[7]

C. The U.S. Should Propose Revisions to Radio Regulation 797A to Enable the 5000-5250 MHz Band to be Used for MSS Feeder Uplinks.

Existing Radio Regulation 797A, adopted at the 1987 Mobile WARC, permits the 5150-5216 MHz band to be used for feeder links for the Radio-Determination Satellite Service, in the space-to-Earth direction. The United States should propose that the

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[6] At a minimum, the Commission should propose that the U.S. seek C and Ku-band allocations for non-GSO MSS feeder links in the lightly-used Allotment Plan Bands.

[7] GSO/FSS vs. non-GSO MSS (Reverse), Document 4-5/TEMP/2 (Rev.2), June 8, 1994.

entire 5000-5250 MHz band be available, for use by non-geostationary MSS feeder links, in the Earth-to-space direction.

The 5000-5250 MHz band, in the United States, as well as on a worldwide basis, is very lightly used. The band is available for use, pursuant to International Footnote 796, for microwave landing systems (MLS) for precision approach and landing. Original plans for MLS contemplated operations only in the 5030-5091 MHz portion of the band which was later extended up to 5150 MHz for more systems. However, currently the U.S. spectrum needs for MLS indicate that all planned systems could be accommodated in the original 5030-5091 MHz band.

Operation of MSS uplink feeder links in this band will cause no harmful interference to aeronautical radionavigation systems. LQP has conducted a study of the airports which may utilize the (MLS) within the United States, and has determined that Globalstar gateway earth stations can be located at least 100-150 miles from such airports. This separation distance will be more than adequate to protect potential MLS operations, should they be installed.[8]

LQP provided an extensive analysis of its ability to operate compatibly with MLS in the 5000-5250 MHz band in the Technical Appendix of its Reply Comments to the MSS NPRM. As LQP stated in those Reply Comments, it seeks "the cooperation of the FAA and the NTIA in identifying appropriate methods for operating MSS feeder links in the 5000-5250 MHz band."[9] Moreover, at the recent international meeting of ITU-R Task Group 4/5, the group concluded that:

> TG 4/5 is of the preliminary view that:
>
> - sharing of non-GSO MSS feeder-links (both downlinks and uplinks) with ARNS [aeronautical radionavigation service] systems in the 5.00-5.25 GHz band would appear feasible, since the interference into MLS receivers

[8] MSS NPRM, LQP Reply Comments, Technical Appendix.

[9] MSS NPRM, LQP Reply Comments, at p. 69.

would be within the assumed permissible levels.[10]

LQP urges the Commission to recommend a United States proposal to revise footnote 797A to make the entire 5000-5250 MHz band available to MSS feeder uplinks, subject to protection of aeronautical radionavigation installations. The United States should propose that Footnote 797A be revised as follows:

MOD 797A Additional allocation: ~~In the countries listed in Nos. 733B and 753C, and subject to agreement obtained under the procedure set forth in Article 14, t~~ The band ~~5150-5216~~ 5000-5250 MHz is also allocated to the radiodetermination-satellite service and the mobile-satellite service ~~(space-to-Earth)~~ (Earth-to-space) on a primary basis. ~~In Regions 1 and 3, except those countries listed in Nos. 733B and 753C, the band is also allocated to the radiodetermination-satellite service (space-to-Earth) on a secondary basis.~~ The use by the radiodetermination-satellite service and the mobile-satellite service is limited to feeder links in conjunction with the radiodetermination-satellite service and the mobile-satellite service ~~operating in the bands 1610-1626.5 MHz and/or 2483.5-2500 MHz. The total power flux-density at the Earth's surface shall in no case exceed -159 dBw/m^2 in any 4 kHz band for all angles of arrival.~~ Locations for feeder link earth stations are required to be coordinated with aeronautical radionavigation operations.

This revision will enable the band 5000-5250 MHz to be used, in the Earth-to-space direction, for MSS and RDSS feeder links, while providing a mechanism to ensure that no harmful interference will be caused to aeronautical radionavigation services. Moreover, to the extent the aeronautical community is interested in using MSS, it would need service with high reliability and high availability. In this regard, feeder links in the 5 GHz band are the best option because rain fade is more easily

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[10] Draft Liaison Statement to Task Group 8/3 and Working Party [8B or 8C], Document 5-5/TEMP/7(Rev.1)-E, June 8, 1994. Task Group 4/5 also drafted a liaison letter to the International Civil Aviation Organization, seeking to "exchange information on the technical and operational characteristics (including protection criteria) as well as implementation plans for relevant systems providing ARNS services (eg MLS) in the 5.00-5.25 GHz and 15.4-15.7 GHz and MSS feeder link systems." See Draft Liaison Letter to ICAO, Document 4-5/TEMP/6-E, June 7, 1994.

managed in C-band.

D. The United States Should Resist Efforts of Other Administrations to Utilize Only the 20/30 GHz Band for MSS Feeder Links.

As LQP stated in its Comments in the MSS NPRM, MSS feeder links must be located in a variety of frequency bands to enable multiple LEO MSS systems to implement their various system designs and architectures.[11] In addition, LQP pointed out the increasing requirements for LEO MSS feeder links, new fixed-satellite systems, and the new Local Multipoint Distribution Service (LMDS) would render virtually impossible the task of locating all the LEO MSS feeder links in the 20/30 GHz band.[12]

Other administrations may seek to restrict LEO MSS feeder links to the 20/30 GHz frequency band. These efforts must be resisted because this would neither enable the United States to meet all its requirements for use of the 28 GHz band, nor permit systems such as Globalstar to utilize its proposed system design, architecture and service approach to the benefit of the user public.

As LQP stated in its Comments in the MSS NPRM, the Commission's belief that all qualified non-geostationary MSS systems feeder link requirements can be met in the 20/30 GHz band is misplaced. The combined feeder link requirements for non-geostationary MSS systems if located at 20/30 GHz are likely to exceed 1200-1600 MHz in each direction. For example, if required to use feeder links in the 20/30 GHz, LQP's Globalstar system would require approximately 400 MHz of feeder link spectrum in each direction, on a dedicated basis. This is at least twice the bandwidth Globalstar needs at C or Ku-band. Spectrum requirements for the 20/30 GHz band are already extensive, including the 2,000 MHz recently proposed by the Commission for use by LMDS, FSS systems, the recently proposed Teledesic global low-earth orbit FSS system, as well as the feeder links requested by TRW Inc. and Motorola. In

[11] MSS NPRM, LQP Comments, at pp. 85-86.

[12] Id.

addition, these bands increasingly are used for terrestrial services around the world.

Because of the infeasibility of placing all non-geostationary MSS feeder links in the 20/30 GHz band, as well as the detrimental impact on the ability of MSS systems to implement system design and service concept, the U.S. should propose that WRC-95 adopt feeder link allocations for MSS systems in a variety of frequency bands.

E. The United States Should Propose Revisions to RR 2613.

Radio Regulation 2613, as revised at WARC-92, provides that:

> Non-geostationary space stations shall cease or reduce to negligible level their emissions, and their associated earth stations shall not transmit to them, whenever there is insufficient angular separation between non-geostationary satellites and geostationary satellites resulting in unacceptable interference to geostationary-satellite space systems in the fixed-satellite service operating in accordance with these Regulations.

This regulation, as written, could create the perception that non-geostationary satellite systems have a secondary status with relation to geostationary satellites operating in the fixed service. The United States should take steps at WRC-95 to clarify that this is not the case.

In the Notice of Proposed Rulemaking to establish licensing and service rules for non-geostationary MSS systems, the Commission stated that it agreed with the MSS Above 1 GHz Negotiated Rulemaking Committee's interpretation of RR 2613.[13] This approach would require the geostationary system and non-geostationary system to agree as to what constitutes harmful interference. Consequently, non-geostationary space stations would not be required to cease transmissions unless harmful interference can be demonstrated to be the actual result of insufficient angular separation.

The United States has also used this approach to RR 2613 as a basis for input to the ITU-R, at the September, 1993 meeting of Working Group 4A. See Document

[13] MSS NPRM, at paras. 73-74, citing the Report of the MSS Above 1 GHz Negotiated Rulemaking Committee, (Apr. 6, 1993), at p. 29.

4A/244-E, September 22, 1993. This submission of the United States proposes that administrations must first define "unacceptable interference," and that the ITU-R also develop recommendations concerning "acceptable interference." The contribution suggests that an administration with a geostationary system which seeks to invoke RR 2613 would have to engage in bilateral or multilateral discussions concerning "unacceptable interference," within a timely manner, or lose its right to invoke RR 2613.

At the international meeting of ITU-R Task Group 4-5, an extensive review of the applicability of RR 2613 to the implementation of non-GSO MSS systems was made. The task group proposed language for the Conference Preparatory Meeting to WRC-95 which states that "(T)here is a general recognition that both the GSO FSS satellite networks and Non-GSO MSS feeder links must have a regulatory base which permits their orderly operation without any regulatory uncertainties to their full operational life."[14] The paper goes on to suggest use of several categories to identify current and future FSS allocations, identify their usefulness for non-GSO MSS feeder links. These categories would be: "a) allocations where GSO FSS Networks have priority; b) allocations where non-GSO MSS Feeder Link Networks have priority; and c) allocations where GSO FSS networks and non-GSO MSS feeder link networks have equal status."[15] The development of these categories may be useful to identify situations in which RR 2613 is appropriate to apply and to exclude other situations.

The United States should continue its initiatives within the ITU-R to ensure that non-GSO MSS feeder links are not inadvertently accorded a lesser status than geostationary FSS systems. This will enable non-geostationary MSS systems to proceed without concern that operators of geostationary satellite systems may seek to place them in a secondary status.

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[14] See Document 4-5/TEMP/14E, June 8, 1994.

[15] Supra., at pp. 2-3.

III. THE UNITED STATES SHOULD PROPOSE A REVISED PFD LIMIT FOR THE 2483.5-2500 MHz BAND

To facilitate MSS systems using the 2483.5-2500 MHz band on a shared basis with terrestrial fixed service systems and to minimize coordinations, two actions must be taken with respect to PFD levels: (1) the PFD level should be increased and (2) the level must be clarified as a trigger rather than an absolute value.

The PFD level must be greater than that currently applicable to the band (RR 2566). The Commission should propose that the United States recommend replacement of the reference in Footnote 753F to RR 2566 with the following:

> -147 dB(W/m^2) in any 4 kHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;
>
> -147 + 0.65(δ-5) dB(W/m^2) in any 4 kHz band for angles of arrival δ (in degrees) between 5 and 25 degrees above the horizontal plane;
>
> -134 dB(W/m^2) in any 4 kHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.
>
> These limits relate to the power flux-density which would be obtained under assumed free-space propagation conditions.

Recent analysis of the impact of LQP's proposed operation on fixed services operating in the 2483.5-2500 MHz band demonstrates that typical CDMA LEO MSS operations, at the higher PFD proposed, will not cause interference. LQP has submitted a paper to USTG 2-2 proposing adoption of the above PFD values.[16] This paper demonstrates that operation of a CDMA LEO MSS system such as GLOBALSTAR within these PFD limits would not cause harmful interference into analog line-of-sight radio relay systems.

The ITU-R already has begun consideration of the ability of LEO MSS systems to operate compatibly with terrestrial fixed service systems. At the most recent international meeting of Radiocommunication Sector Task Group 2-2, output

[16]USTG 2-2/2 (Rev.2), July 12, 1994.

Document 2-2/TEMP/1(Rev.5), dated 8 February 1994, states that:

> there appears to be some sharing margin available between certain MSS and fixed service systems which have not been fully exploited. First, Non-GSO MSS satellite systems have more system design variables than GSO MSS systems. For example, Doc. 2-2/26 indicates the influence of spot beam use on non-GSO MSS satellites in improving the possibility of sharing. Also, Doc. 2-2/31 show how system pfd levels can be improved by taking account of the orbital transmission characteristics of a particular system. Doc. 2-2/27 indicates how the pfd level can be improved as a consequence of the statistical properties of the system implemented.

The LQP input document 2-2/27, contains the results of a simulation of interference into analog radio-relay routes from low-earth orbiting satellites of the Globalstar system. This computer simulation of possible interference from the Globalstar system into terrestrial fixed stations indicates that, at the three latitudes sampled, the interference levels into the FS network are below the limits stated in Recommendation 357 which defines both short- and long-term limits of interference allowed into analog angle/modulated radio-relay systems in bands shared with the fixed satellite service (FSS). This analysis supports imposing PFD limits on MSS satellites which are higher than those specified in Radio Regulation No. 2566.

In addition, at WRC-95, the United States must clarify that the PFD level contained in Footnote 753F constitutes a "trigger value" rather than an absolute limit and for adoption of a more flexible approach to determining when coordination between MSS and terrestrial systems is required. Such an approach is proposed in a United States submission to Radiocommunication Sector Task Group 2-2 and discussed in the output of the most recent international meeting of Task Group 2-2. Document 2-2/TEMP/3, Annex 1, February 3, 1994, provides that, in the case of non-GSO MSS systems, "RR 726 requires use of Resolution 46 procedures to bring into service non-GSO MSS systems for coordination with terrestrial services if the pfd exceeds the limits in No. 2566." Document 2-2/TEMP/1 (Rev. 5), Annex 1 provides a three-step approach for coordinating non-GSO MSS systems with terrestrial

systems. This process would utilize the PFD as a preliminary determination to determine if further steps would need to be taken.

For example, if the non-GSO MSS system operated within the PFD level applicable to the frequency band, no further action would be required. If the non-GSO MSS system proposed a PFD which exceeded this level, a technical examination would be undertaken, taking into account the individual system characteristics, to determine if actual interference to terrestrial systems might occur. Based on the outcome of this examination, it might be possible to permit the non-GSO system to go forward without the need for coordination with numerous administrations. Since the non-GSO CDMA MSS systems such as LQP can demonstrate that they will not cause harmful interference, the United States should both adopt the highest possible PFD consistent with co-channel operation with the fixed service, as well as the multi-step approach. These actions will minimize the possibility of time-consuming and costly coordinations for fixed service interests as well as the MSS systems.

With regard to coordination, the United States should ensure that Resolution 46 and other applicable procedures do not impede the implementation of non-geostationary MSS systems. In this regard, it may be necessary to propose revisions to Resolution 46. Based on the on-going work within the Commission's WRC-95 Industry Advisory Committee, as well as within the ITU-R, it appears that revisions to Resolution 46 which reduce the coordination burdens for non-geostationary MSS systems may be identified. LQP urges the Commission to evaluate such proposed revisions, when they are presented, and adopt, for U.S. proposals, appropriate modifications which will facilitate the implementation of MSS.

IV. THE UNITED STATES SHOULD PROPOSE MODIFICATION OF FOOTNOTE 731E TO ALLOW MSS SYSTEMS FULL USE OF THE 1610-1626.5 MHz BAND

The United States must propose revision of Footnote 731E regarding protection of the GLONASS system, to assure that MSS systems will have full use of the 1610-1626.5 MHz band. Elimination of the final sentence of the footnote will enable MSS

to proceed with the use of this band without unnecessarily restrictive constraints on the use of the band now shared with the Russian GLONASS system.

The U.S. should propose the following revision to Footnote 731 E:

MOD **731E** The use of the band 1 610-1 626.5 MHz by the mobile-satellite service (Earth-to-space) and by the radiodetermination-satellite service (Earth-to-space) is subject to the application of the coordination and notification procedures set forth in Resolution **46 (WARC-92)**. A mobile earth station operating in either of the services in this band shall not produce an e.i.r.p. density in excess of -15 dB(W/4 kHz) in the part of the band used by systems operating in accordance with the provisions of No. **732**, unless otherwise agreed by the affected administrations. In the part of the band where such systems are not operating, a value of -3 dB(W/4 kHz) is applicable. ~~Stations of the mobile satellite service shall not cause harmful interference to, or claim protection from, stations in the aeronautical radionavigation service, stations operating in accordance with the provisions of No. **732** and stations in the fixed service operating in accordance with the provisions of No. **730**~~.

This revision of Footnote 731E will enable MSS systems to utilize the full 1610-1626.5 MHz, while still enabling accomplishment of the GLONASS mission.

(1) As LQP proposed in its Comments on the MSS NPRM, GLONASS operations below 1606 MHz can be protected by MSS without impairing the use of the system as a part of the Global Navigation Satellite System (GNSS) which would utilize both GPS and GLONASS in aeronautical navigation, including precision landing.

(2) Revision of this footnote also will provide an incentive for Russia to revise its GLONASS frequency plan, aiding in U.S. government efforts to achieve this objective, to the benefit of both MSS and radioastronomy operations. As LQP stated in its Comments on the MSS NPRM, protection of GLONASS, above 1606 MHz, is inconsistent with U.S. policies supporting protection of radioastronomy, and with U.S. policies supporting the implementation of MSS. Moreover, protection of receipt of

GLONASS signals above 1606 MHz is not even required to enable the utilization of GLONASS in a Global Navigation Satellite System (GNSS) in the event the U.S. government supports and the international aviation community adopts the use of GNSS using both GPS and GLONASS.

As the NRM Committee recommended:

> "the best solution to enable both MSS and GLONASS to operate compatibly without operational constraints is to effect a reconfiguration of the GLONASS frequency plan."[17]

However, obtaining agreement of the Russian administration has proved elusive. LQP believes it is important to provide adequate incentive for Russia to enter into a written commitment to reconfigure the GLONASS frequency plan no later than 1998. A U.S. proposal to WRC-95 to modify Radio Regulation 731E also will send a signal to Russia (as well as other administrations) which could assist in creating an incentive for Russia to revise the GLONASS frequency plan. This approach should meet with approval from proposed participants and users of MSS systems, as well as the radioastronomy community.

(3) GLONASS receiver manufacturers will be placed on notice to install filters preventing receipt of transmissions above 1606 MHz. Extensive investment in GLONASS receivers which can receive signals above 1606 MHz would create a larger community with an economic interest in keeping MSS out of the 1610-1616 MHz band, and therefore must be deterred.

(4) As demonstrated in LQP's Technical Appendices to its Comments and Reply Comments on the MSS NPRM, even if the international aviation community decides that the GNSS should include both GPS and GLONASS to provide a level of integrity checking of navigational data, all the GLONASS frequencies are not required to achieve the benefits of using both systems. The Sat-Tech Study, commissioned by LQP, supports the conclusion that virtually all aviation objectives can be achieved through use of GPS and as few as six GLONASS satellites operating

[17] Supra. at p. 43.

below 1606 MHz.[18] The Sat-Tech Study further points out that other navigation systems, including terrestrial differential GPS, geostationary satellites, wide-area augmentation systems (WAAS) and use of barometric altimeters on-board aircraft, also will be used in conjunction with the GNSS, as appropriate, and will increase integrity even further. GNSS need not include GLONASS frequencies above 1606 MHz to achieve its operational objectives and requirements. Consequently, requiring MSS to protect receipt of GLONASS signals above 1606 MHz is neither necessary nor desirable, and would merely impose intolerable burdens on MSS.

V. THE UNITED STATES SHOULD PROPOSE ADDITIONAL ALLOCATIONS FOR MSS

The United States must ensure, at WRC-95, that adequate spectrum is available for non-geostationary MSS systems. The 1610-1626.5 MHz and 2483.5-2500 MHz band can accommodate only the first generation of non-geostationary MSS systems; additional spectrum is needed to accommodate market demand in future generations.

Vice President Gore as well as Chairman Hundt recently recognized the vital role of satellites in providing communications infrastructure throughout the world. As Chairman Hundt stated in his address to the World Telecommunications Development Conference, "[S]atellite technology offers opportunities to build a global, seamless connection among all networks. There is no more compelling case for governmental cooperation and parallel regulation than that presented by satellite providers. They seek to serve the globe...."[19]

The Vice President highlighted the importance of satellites in the Global

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[18] Current planning of the Russian Federation indicates up to 24 satellites operating below 1606 MHz at the time of MSS service launch. Thus, with anti-podal operation, there will be 12 GLONASS satellites available for GNSS, which is sufficient to handle GLONASS failures.

[19] See Address of Chairman Reed E. Hundt to the World Telecommunication Development Conference (Buenos Aires, Mar. 22, 1994).

Information Infrastructure when he said: "Constellations of hundreds of satellites in low earth orbit may soon provide telephone or data services to any point on the globe. Such systems could make universal service both practical and affordable." [20]

MSS systems will realize this goal only if they have adequate spectrum to support demand for service. LQP, as well as other applicants for MSS licenses, already is planning it's second generation system. It is essential that additional spectrum for MSS be identified as soon as possible because of the long lead time required for the planning, financing and construction of satellite systems. The United States therefore must continue to pursue the objective of ensuring adequate spectrum for MSS at WRC-95.

Among the possible frequency bands which should be considered for proposed allocation to MSS at WRC-95 are bands to be made available by the federal government for commercial communications services.[21] In particular, the Commission has sought comments on the proposal by NTIA to make available the 2390-2400 MHz band. LQP, in its Reply Comments in this proceeding, proposed that the Commission allocate the 2390-2400 MHz band in the Earth-to-space direction for MSS, and the 2300-2310 MHz band in the space-to-Earth direction. NTIA proposes to make available the 2390-2400 MHz band immediately, and the 2300-2310 MHz band in 1996.[22]

As LQP stated in its Reply Comments in that docket, "(A) paired band could be especially useful to provide additional user uplink and downlink capacity in MSS systems."[23] These bands would be even more useful to non-geostationary MSS systems with an international allocation, which should be sought at WRC-95.

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[20] See Address of Vice President Albert Gore to the World Telecommunication Development Conference (Buenos Aires, Mar. 21, 1994).

[21] See, Notice of Inquiry, FCC 954-97, released May 4, 1994 ("Spectrum NOI").

[22] See Preliminary Spectrum Reallocation Report, NTIA Special Publication 94-27, February, 1994, at p. iv.

[23] Spectrum NOI, LQP Comments, at p. 3.

The process of identifying appropriate frequency bands for additional MSS allocations is underway within the Commission's Industry Advisory Committee. LQP will participate to assist in identifying bands which would be appropriate candidates for allocation to MSS at WRC-95.

VI. THE UNITED STATES SHOULD MAINTAIN THE FOCUS OF WRC-95 ON MSS

The U.S. should ensure that WRC-95 addresses the needs of MSS for revisions to the current international Tables of Allocations, to remove impediments to the current allocations, to make available feeder link spectrum, to facilitate the implementation of first generation non-geostationary MSS systems, and to attain new MSS allocations to accommodate the future spectrum requirements. The U.S. should seek to defer detailed consideration of the Report of the Voluntary Group of Experts to a future radiocommunication conference.

The Report of the Voluntary Group of Experts is extremely long and complex. It addresses hundreds of provisions of the Radio Regulations, including sections that address coordination processes for satellite systems. At WRC-95, many administrations will be reviewing this report for the first time. The few weeks allocated to the conference will be insufficient to enable most delegations to form preliminary opinions, consult with experts in their home countries, and to finalize positions on the proposed changes. It should be the position, if not the proposal of the United States, that the Report of the Voluntary Group of Experts be presented at WRC-95, for review by administrations during the interim between that conference and WRC-97, at which time it can be considered on substantive basis. This approach will enable administrations to fully review this document and also will enable the essential issues relating to MSS systems to be adequately addressed at WRC-95.

Consequently, the United States should make every effort to maintain the focus of WRC-95 on MSS, and not allow valuable conference time and resources to be diverted to an exhaustive review of the Report of the Voluntary Group of Experts.

VII. Conclusion

The United States must adopt proposals for WRC-95 which will enhance the operation of MSS systems and enable them to fulfill their mission of providing global communications service within the next few years. This Conference offers a key opportunity to eliminate existing impediments to operation of MSS, as well as to address spectrum needs for feeder links and second generation systems. LQP plans to participate fully on the Commission's Industry Advisory Committee in preparation for WRC-95 and stands ready to support the Commission in this activity which will advance the implementation of critical communications services throughout the world.

Respectfully submitted,

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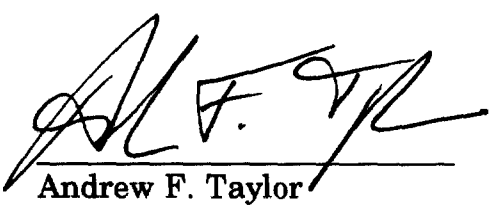

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